FOREST ROAD EXCISE TAX SUMMARY SHEET

Region: Pacific Cascade

Timber Sale Name: The Boondocks

Application Number: 30-076343

Excise Tax Applicable Activities

Construction: 2878 **linear feet**
Road to be constructed (optional and required) but not abandoned

Reconstruction: 14002 **linear feet**
Road to be reconstructed (optional and required) but not abandoned

Abandonment: 1430 **linear feet**
Abandonment of existing roads not reconstructed under the contract

Deactivation: 0 **linear feet**
Road to be made undriveable but not officially abandoned.

Pre-Haul Maintenance: 0 **linear feet**
Existing road to receive maintenance work (specifically required by the contract) prior to haul

Excise Tax Exempt Activities

Temporary Optional Construction: 0 **linear feet**
Optional roads to be constructed and then abandoned

Temporary Optional Reconstruction: 1260 **linear feet**
Optional roads to be reconstructed and then abandoned

New Abandonment: 0 **linear feet**
Abandonment of roads constructed or reconstructed under the contract

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

THE BOONDOCKS

ROAD PLAN

SECTION 8, 9, 16, 17, TOWNSHIP 13 NORTH, RANGE 05 WEST, W.M.
LEWIS COUNTY

LEWIS DISTRICT

AGREEMENT NO.: 30-076343

CONTRA[illegible] ADMINISTRATOR: Scott Sargent

DATE: 05/01/2004

STA[illegible] ENGINEER: Matthew T. Miskovic

DRAW[illegible] & COMPILED BY: Alicia Compton

SECTION 0 – SCOPE OF PROJECT

This project includes but is not limited to construction and optional construction inclu[illegible]ing:

clearing;
grubbing;
right-of-way debris disposal;
excavation and/or embankment to subgrade;
landing construction;
acquisition and installation of drainage structures;
acquisition, manufacture, and application of rock;
grass seeding.

This project also includes but is not limited to reconstruction and optional reconstruction including:

cleaning ditches;
acquisition and installation of additional drainage structures;
compaction of road surface;
acquisition, manufacture, and application of rock, including existing turnouts;
grass seeding.

This project also includes but is not limited to abandonment including:

medium abandonment.

SECTION 1 - GENERAL CLAUSES

1.1-1

Clauses in this plan apply to all construction, reconstruction, or abandonment including landings unless otherwise noted.

1.1-2

Construction or reconstruction of the following roads is required. All roads shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
N-1000	2+88 to 84+40	Reconstruction
N-1025	0+00 to 42+90	Reconstruction
N-1028	0+00 to 1+72	Construction

1.1-3

Construction or reconstruction of the following roads is not required. Roads used by the Purchaser shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
N-1027	0+00 to 28+20	Reconstruction
N-1027A	0+00 to 8+00	Construction
N-1028	1+72 to 18+53	Construction
N-1028A	0+00 to 2+25	Construction

1.1-4

If the Purchaser desires a road location or design change, a revised Road Plan shall be submitted to the State for consideration.

1.1-5

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.1-10

Abandonment of the following road is required. Road shall be abandoned in accordance with this Road Plan.

Road	Stations	Type
N-1027	15+60 to 42+50	Medium

1.2-1

The construction, reconstruction, or abandonment of any roads specified herein shall not be permitted between September 30 and May 1 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-2

Purchaser shall not use roads constructed or reconstructed under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-6

Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culvert placement in live streams shall precede embankment where culverts are to be placed along natural ground.
Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, and culvert installations shall be completed and are subject to written approval by the Contract Administrator prior to rock application and/or timber haul.

1.3-2

Hauling shall be suspended when wheel track rutting exceeds 6 inches unless Purchaser elects to correct the situation at his/her own expense. Corrective measures and continued operations are subject to written approval by the Contract Administrator.

1.4-3

Reference points (R.P.'s) that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said R.P.'s until all moved or damaged R.P.'s are reset.

1.5-1

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

SECTION 2 - CLEARING

2.1-1

Fell all vegetative material larger than 2 inches DBH or over 5 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

SECTION 3 - GRUBBING

3-1

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed.

3-2

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1

Right-of-way debris is defined as all nonmerchantable vegetative material larger than one cubic foot in volume within the grubbing limits.

4.1-2

All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.

4.2.3-1

Right-of-way debris shall be scattered outside the grubbing limits.

4.2.3-2

Right-of-way debris shall not be placed against standing timber.

SECTION 5 - EXCAVATION

5.1-1

Roads shall be constructed or reconstructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-3

Road grade and alignment shall conform to the State's marked location. Grade and alignment shall have smooth continuity without abrupt changes in direction. Maximum grades are: 18 percent favorable and 12 percent adverse. Minimum radius curve is 60 feet.

5.1-4

Minimum extra widening on the inside of curves shall be:

5 feet extra	80 to 100 foot radius curve
7 feet extra	60 to 80 foot radius curve

5.1-5

Curve widening, where required, shall be added to the inside of curves.

5.1-7

Roads shall be constructed or reconstructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

Tolerance Class	A	B	C
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8

Excavation slopes shall be constructed no steeper than shown on the following table:

Material Type	Excavation Slope Ratio
Common Earth (on side slopes of 55%)	1:1
Common Earth (55% to 70% sideslopes)	¾:1
Common Earth (on slopes over 70%)	½:1
Fractured or loose rock	½:1
Hardpan or solid rock	¼:1

5.1-9

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-10

Embankments shall be widened as follows:

Height at Centerline	Subgrade Widening
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11

Embankment slopes shall be constructed no steeper than shown on the following table:

Material Type	Embankment Slope Ratio
Common Earth and Rounded Gravel	1½:1
Angular Rock	1¼:1
Sandy Soils	2:1

5.1-12

Organic material shall be excluded from embankment.

5.1-18

Turnarounds shall be no larger than 30 feet long and 30 feet wide. Location shall be subject to written approval of the Contract Administrator.

5.1.1-1

Waste material shall not be deposited within 50 feet of a cross drain culvert installation.

5.1.1-3

Waste material may be deposited adjacent to the road prism on side slopes up to 45 percent if the waste material is compacted and more than 100 feet away from live streams. On side slopes of 45 percent or more, all excavation shall be end hauled or pushed to designated embankment sites.

5.1.1-8

The amount of material to be contained in a waste area shall be at the discretion of the Contract Administrator.

5.2-1

Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the grubbing limits, or restrict drainage.

5.3-1

All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts. Side hill embankments too narrow to accommodate excavation equipment may be placed by end-dumping or side casting until sufficiently wide to support the equipment.

5.4-1

Silt-bearing runoff shall not be permitted to go into streams.

5.4-2

Accomplish sediment removal through silt traps, silt fences, settling ponds, or other methods as approved, in writing, by the Contract Administrator.

5.4-3.1

On the following roads, Purchaser shall furnish and evenly spread the seed mixture listed below on all exposed soil inside the grubbing limits at a rate of 40 pounds per acre. The date of application is subject to approval by the Contract Administrator.

Mixture Percent by Weight	Minimum Percent Germination
50% Fescue, Red	90% Germination
25% Ryegrass, Perennial	90% Germination
15% Bentgrass	85% Germination
10% Clover, White and White Dutch (inoculated)	90% Germination

Weed seed shall not exceed 0.5% by weight.

Seed shall be furnished in standard containers on which the following shall be shown:
1. Common name of seed
2. Net weight
3. Percent of purity
4. Percentage of germination
5. Percentage of weed seed and inert material

Required seed not spread by the termination of this contract shall become property of the State.

Road	Stations	Seed Quantity (lbs)
N-1000	26+50 to 31+30	5
N-1000	77+60 to 84+40	10
N-1025	0+00 to 15+00	10
N-1027 Abandonment	15+60 to 42+50	110
N-1027A	0+00 to 8+00	30
N-1028	0+00 to 18+53	75
N-1028A	0+00 to 2+25	10

5.5-4

Constructed or reconstructed subgrades shall be compacted full width except ditch prior to rock application. Compaction shall be by a smooth-drum vibratory roller weighing at least 14,000 pounds. Four complete passes shall be made at a maximum operating speed of 3 mph.

5.5-5

Finished subgrade shall be crowned as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

SECTION 6 - DRAINAGE

6.2.1-1

Purchaser shall furnish, install, and maintain corrugated polyethylene pipe (AASHTO specification No. M-294 Type S) and on culverts over 24 inches, aluminized culverts (meeting ASTM A 819, AASHTO M-274 aluminized steel Type 2 and AASHTO M-36 specifications) as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

6.2.1-2

Manufacturer's approved connectors shall be used for corrugated polyethylene pipe.

6.2.1-5

On required roads: culverts, downspouts, flumes, bands, and gaskets as listed on the CULVERT LIST which are not installed shall become property of the State.

6.2.2.1-1

Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the Corrugated Polyethylene Pipe Association "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."

6.2.2.3-1

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

6.2.2.5-1

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

6.3-1

Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

6.3-2

On the following roads, reshaping and cleaning the ditchline shall be completed prior to application of rock and shall be done in accordance with the TYPICAL SECTION SHEET and the CULVERT AND DRAINAGE SPECIFICATION DETAIL.

Road	Stations
N-1000	26+50 to 31+30
	77+60 to 84+40
N-1025	0+00 to 15+00

6.4-1

Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

6.5-1

Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts.

SECTION 7 - ROCK

7.1-1

Rock for construction and/or reconstruction under this contract may be obtained from a source on State land as listed below at no charge to the Purchaser. Development and use shall be in accordance with a written "Development Plan" prepared by the State. A copy of the written plan is available upon request from the Pacific Cascade Region office. Upon completion of operations, the rock source shall be left in the condition specified in said plan, subject to approval by the Contract Administrator. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using or desire to use this rock source, a joint operating plan shall be developed. All parties shall follow this plan.

Source	Location
N-1100 Quarry	Sec. 16, T13N, R05W, W.M.

7.2.1-4

2 1/2 INCH MINUS CRUSHED and 8 INCH PLUS rock shall meet the following specifications for gradation and quality when placed in hauling vehicles.

7.2.1.1-5
2 ½ INCH MINUS CRUSHED ROCK

% passing 2 ½" square sieve	100%
% passing 2" square sieve	65 -100%
% passing 1" square sieve	50 - 70%
% passing ¼" square sieve	30 - 50%
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.1-10
8 INCH PLUS ROCK

% equal to, or larger in one dimension than the specified size	100%
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.1-12
Landing rock shall be no coarser than 6 INCH MINUS.

7.2.3-1
Measurement of the 2 1/2 INCH MINUS CRUSHED and 8 INCH PLUS rock shall be on a cubic yard truck measure basis. Each truck box shall be measured by the Contract Administrator prior to rock hauling. The Contract Administrator shall periodically require that a load be flattened off and its volume calculated. An average of such volumes for each truck shall be used to tally the volume to be hauled. The Purchaser shall provide and maintain load tally sheets for each truck and shall give them to the Contract Administrator upon request.

7.4.2-1
Apply at least the minimum required rock quantity as shown on the ROCK LIST. Required and optional rock shall meet the specifications on the ROCK LIST.

7.4.2-4
On the following roads, if hauling shall take place only from May 1 to September 30, Purchaser may not be required to place or provide the optional rock in the ROCK LIST. Purchaser shall then be required to submit a written plan for approval by the Contract Administrator describing how these roads shall be constructed, used, and abandoned in compliance with all other clauses in the ROAD PLAN.

Road	Stations
N-1027	15+60 to 28+20
N-1027A	0+00 to 8+00
N-1028	1+72 to 18+53
N-1028A	0+00 to 2+25

7.4.2-9
Turnarounds, turnouts, and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-10
Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-1
Rock shall be mixed, compacted, and graded in sections not to exceed ½ mile in length. Water shall be added in quantities to facilitate compaction. If directed by the Contract Administrator, a minimum of 6 gallons of water per cubic yard of rock shall be applied.

7.4.3-2

Rock shall be spread and compacted full width in one lift not to exceed 12 inches uncompacted depth. Compaction shall be by pneumatic-tired or steel-wheeled smooth drum vibratory roller weighing at least 14,000 pounds. Four complete passes at a maximum speed of 3 mph shall be made on each lift.

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.2-1

Purchaser shall reduce or relocate landing debris, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

9.2-2

Purchaser shall provide for drainage of the landing surface as approved, in writing, by the Contract Administrator.

9.2-3

Landing embankments shall be sloped to original construction specifications.

SECTION 10 - ROAD AND LANDING ABANDONMENT

10.1-1

The following road shall be abandoned by the Purchaser at the termination of use.

Road	Stations	Type
N-1027	15+60 to 42+50	Medium

10.1-3

Medium Abandonment shall consist of:

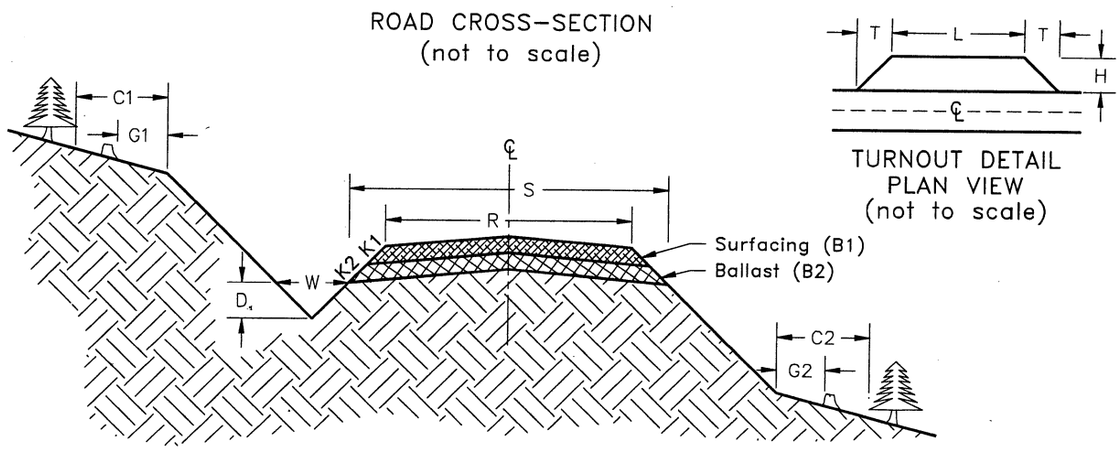
work shall be performed between July 1 and September 30;
filling the ditches;
ripping the surface to a minimum depth of 18 inches;
constructing non-drivable water bars, as directed by Contract Administrator, in conformance with the attached NON-DRIVABLE WATER BAR DETAIL at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 100 feet, or as marked in the field;
skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;
keying water bars into ditchline;
construction of tank trap barrier in conformance with the attached "T" TANK TRAP DETAIL;
removing culverts from State Land;
removing ditch cross drain culverts and leaving the resulting trench open;
sloping all trench walls and approach embankments no steeper than 1.5:1;
removing fill according to FILL REMOVAL SLOPE STAKE DETAIL;
grass seeding concurrently with abandonment and in accordance with Clause: 5.4-3A;
covering, concurrently with abandonment, all exposed soils within 100 feet of any live stream, with a 8 inch deep layer of straw.

10.1-7

On the following road, Purchaser shall remove existing culverts from live streams and leave the resulting trench open with excavation slopes and trench bottom as specified. The trench bottom shall conform to natural stream profile. Excavated material shall be placed in the waste area approved in writing by the Contract Administrator. Culvert removal from live streams shall be in accordance with the Hydraulic Project Approval, FILL REMOVAL DETAIL, SETTLING POND AND PUMP DETAIL, and the LIVE STREAM CULVERT REMOVAL PROCEDURE.

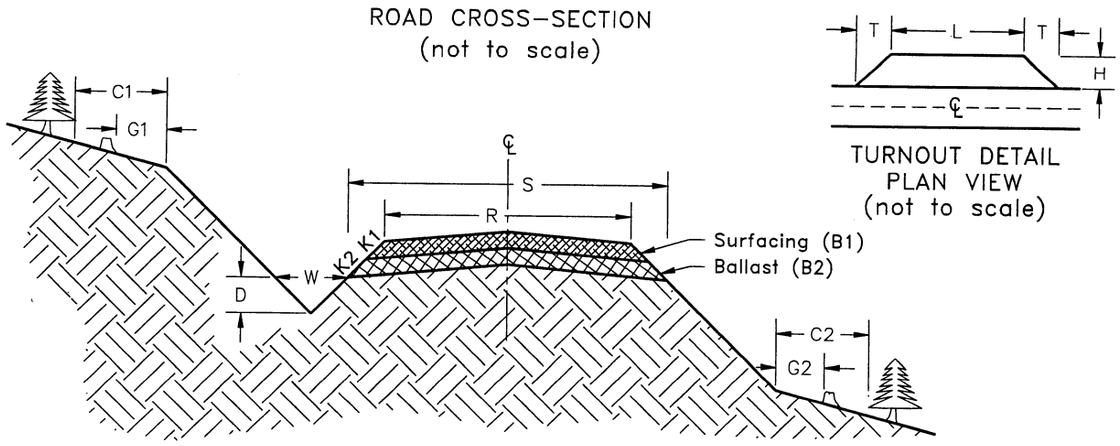
Road	Station	Channel Width (ft)	Excavation Slopes	Waste Area
N-1027	20+00	8	2:1	22+00 of N-1027
	32+00	10	2:1	33+00 of N-1027

TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade Width	Road Width	Ditch		Crown in. @ CL	Grubbing Limits		Clearing Limits	
						Width	Depth					
				S	R	W	D		G1	G2	C1	C2
N-1000	2+88	26+50	C	-	12'	-	-	4"	-	-	-	-
	26+50	31+30	C	-	12'	3'	1'	4"	-	-	-	-
	31+30	77+60	C	-	12'	-	-	4"	-	-	-	-
	77+60	84+40	C	-	12'	3'	1'	4"	-	-	-	-
N-1025	0+00	15+00	C	-	12'	3'	1'	4"	-	-	-	-
	15+00	42+90	C	-	12'	-	-	4"	-	-	-	-
N-1027	0+00	28+20	C	-	12'	-	-	4"	-	-	-	-
N-1027A	0+00	8+00	C	12'	10'	2'	1'	4"	3'	3'	5'	5'
N-1028	0+00	18+53	C	12'	10'	2'	1'	4"	3'	3'	5'	5'
N-1028A	0+00	2+25	C	12'	10'	2'	1'	4"	3'	3'	5'	5'

ROCK LIST



BALLAST

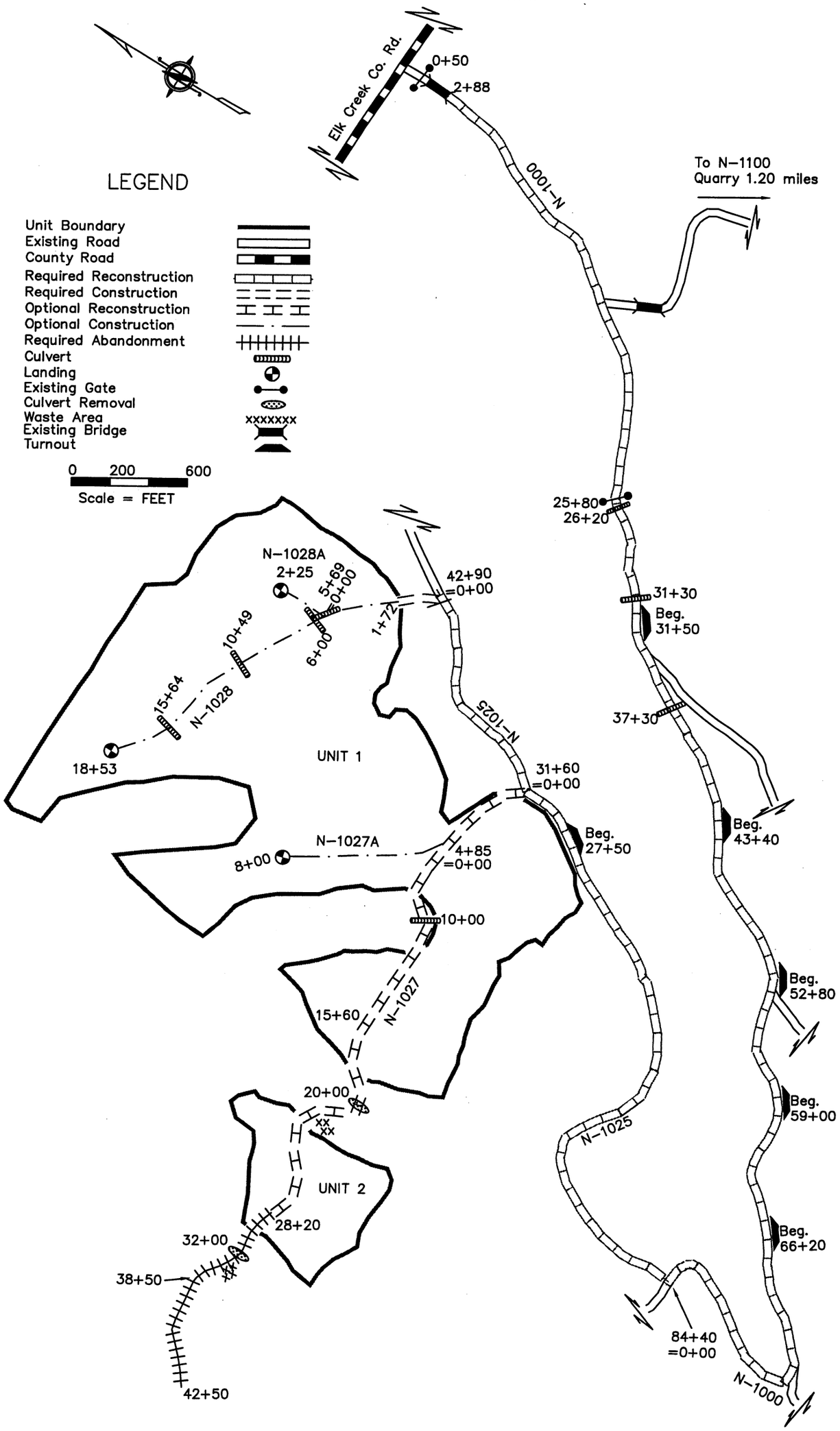
Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout Length	Turnout Width	Turnout Taper
			K2	B2					L	H	T
					2 ½ INCH MINUS CRUSHED			N-1100 Quarry			
N-1000	2+88	84+40	1 ½:1	8"	40	81.52	3261				
	Turnouts (5)		1 ½:1	8"	40		200		50'	10'	50'
	Culvert backfill						60				
N-1025	0+00	42+90	1 ½:1	8"	40	42.90	1716				
	Turnout (1)		1 ½:1	8"	40		40		50'	10'	50'
N-1027	0+00	15+60	1 ½:1	8"	40	15.60	624				
*	15+60	28+20	1 ½:1	8"	40	12.60	504				
	Culvert backfill						30				
*N-1027A	0+00	8+00	1 ½:1	8"	34	8.00	272				
*	Landing						60				
N-1028	0+00	1+72	1 ½:1	8"	34	1.72	58				
*	1+72	18+53	1 ½:1	8"	34	16.81	572				
*	Landing						60				
*N-1028A	0+00	2+25	1 ½:1	8"	34	2.25	76				
*	Landing						60				
						8 INCH PLUS		N-1100 Quarry			
N-1000	Culverts						4				
N-1027	Culverts						2				
N-1028	Culverts						3				
N-1028A	Culvert						1				

*NOTE: Optional rock according to clause 7.4.2-4.

OPTIONAL 2 ½ INCH MINUS CRUSHED TOTAL 1,604 Cubic Yards
REQUIRED 2 ½ INCH MINUS CRUSHED TOTAL 5,989 Cubic Yards
8 INCH PLUS TOTAL 10 Cubic Yards

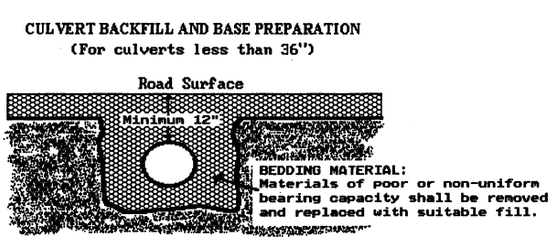
THE BOONDOCKS

ROAD PLAN MAP



CULVERT LIST

Road Number	Location	Culvert Dia.	Culvert Gauge	Length (ft) Culvert	Downspt	Flume	Riprap (C.Y.) Inlet	Outlet	Type	Backfill Material	Backfill Qty. yd^3	Const. Staked	Remarks
			If Steel										
N-1000	26+20	18"	-	40	-	-	½	½	8"	2 ½	20	-	Replacement
	31+30	24"	-	40	-	-	1	1	8"	2 ½	20	-	Replacement
	37+30	18"	-	30	-	20	½	½	8"	2 ½	20	-	
N-1027	10+00	24"	-	40	-	-	1	1	8"	2 ½	30	-	Replacement
N-1028	6+00	18"	-	30	-	-	½	½	8"	NT	-	-	
	10+49	18"	-	30	-	-	½	½	8"	NT	-	-	
	15+64	18"	-	30	-	-	½	½	8"	NT	-	-	
N-1028A	0+00	18"	-	30	-	-	½	½	8"	NT	-	-	

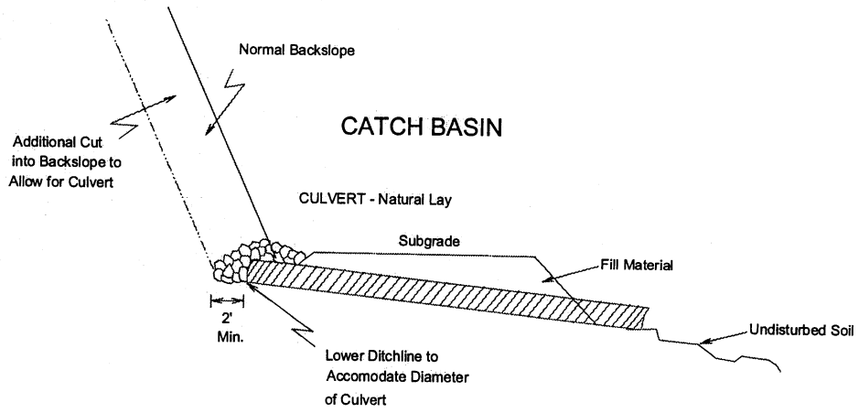


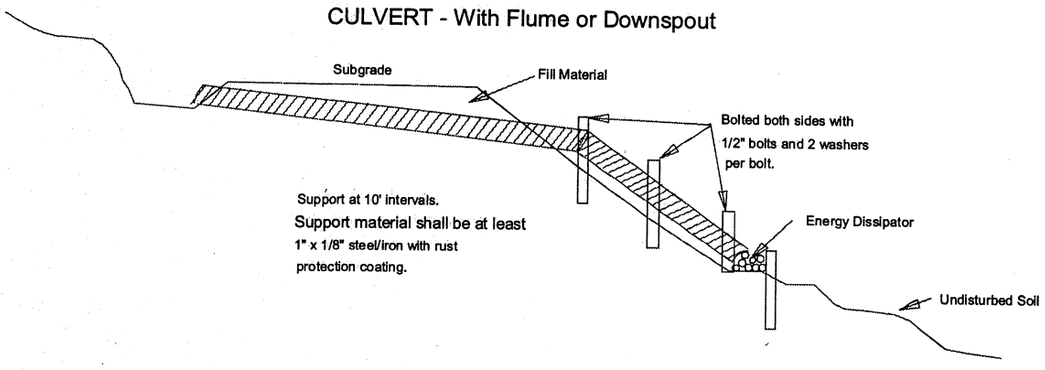
Key:

2 ½ - 2 ½ Inch Minus Crushed Rock
8" - 8 Inch Plus Rock
NT - Native (bank run)
SL - Select Fill
HL - Heavy Loose Riprap
LL - Light Loose Riprap
Flume - Half round pipe
Downspout - Full round pipe

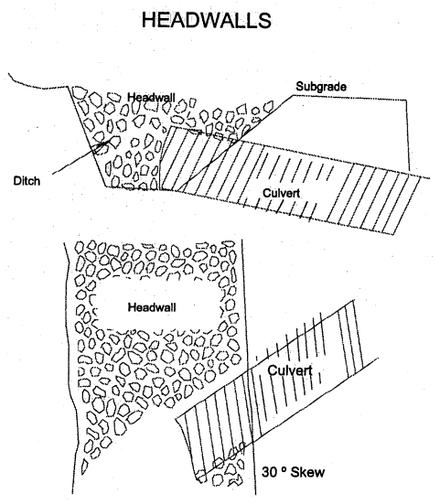
CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 1 of 2)

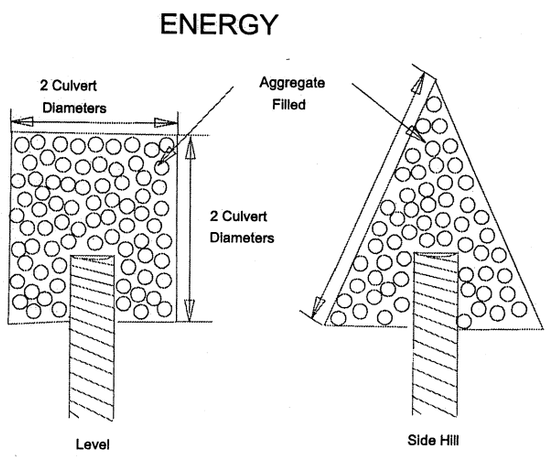




Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.



Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

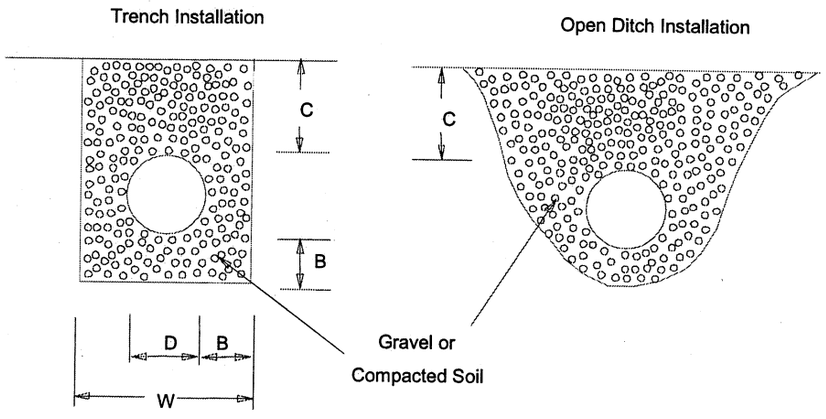
1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.

2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.

3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.

4. Site conditions and availability of bedding materials often dictate the type of installation method used.

5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.



MINIMUM DIMENSIONS
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills
   1. Maintain slope lines as constructed. Remove slides from ditches and roadway. Replace fills to 1½:1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
   2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
   3. Undesirable slide materials and debris shall not be mixed into the surface material.

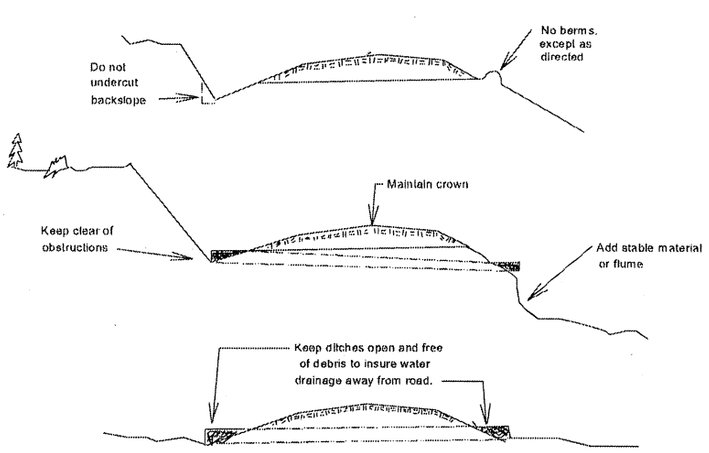
B. Surface
   1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
   2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
   3. Watering may be required to control dust and to retain fine surface rock.
   4. Desirable surface material shall not be bladed off the roadway.
   5. Replace surface material lost or worn away.
   6. Remove berms except as directed by the State.
   7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage
   1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
   2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
   3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
   4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
   5. Keep silt bearing surface runoff from getting into live streams.

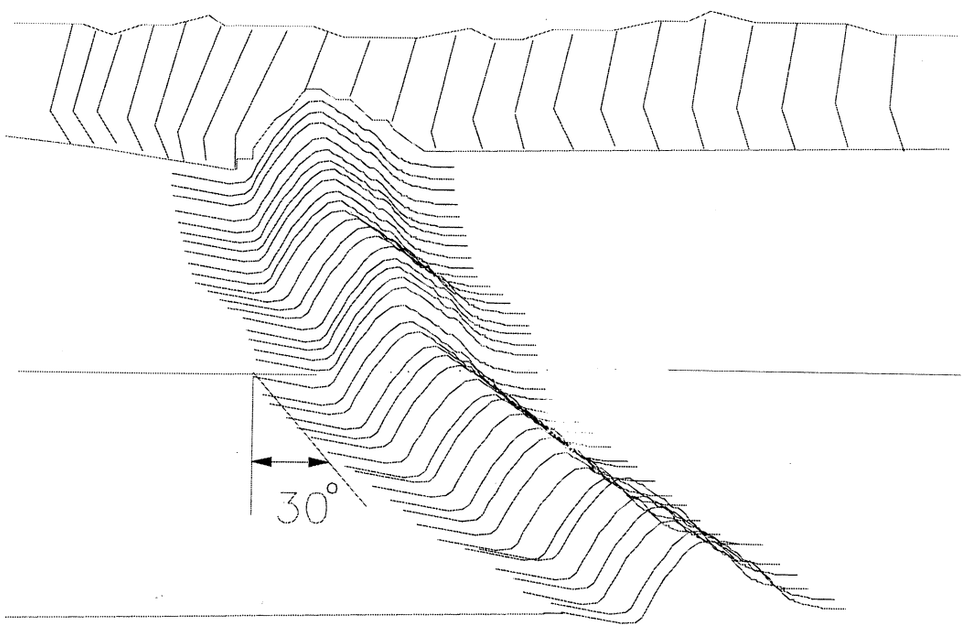
D. Structures
   Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

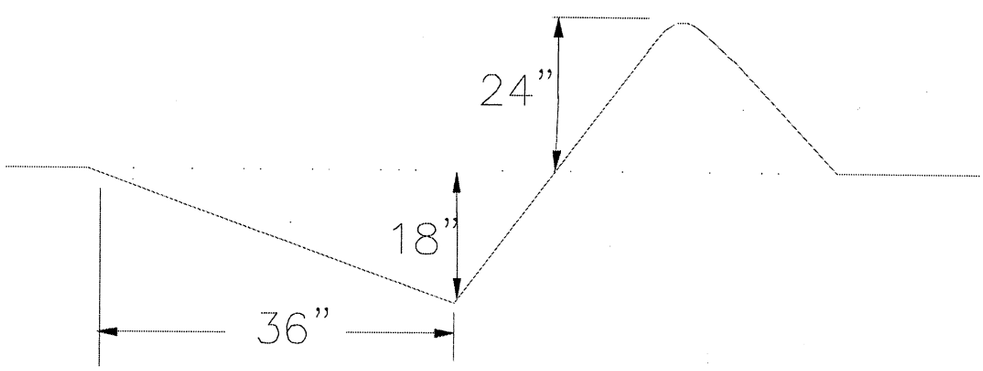
E. Termination of Use or End of Season
   Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

F. Debris
   Remove fallen timber, limbs, and stumps from the slopes or roadway.

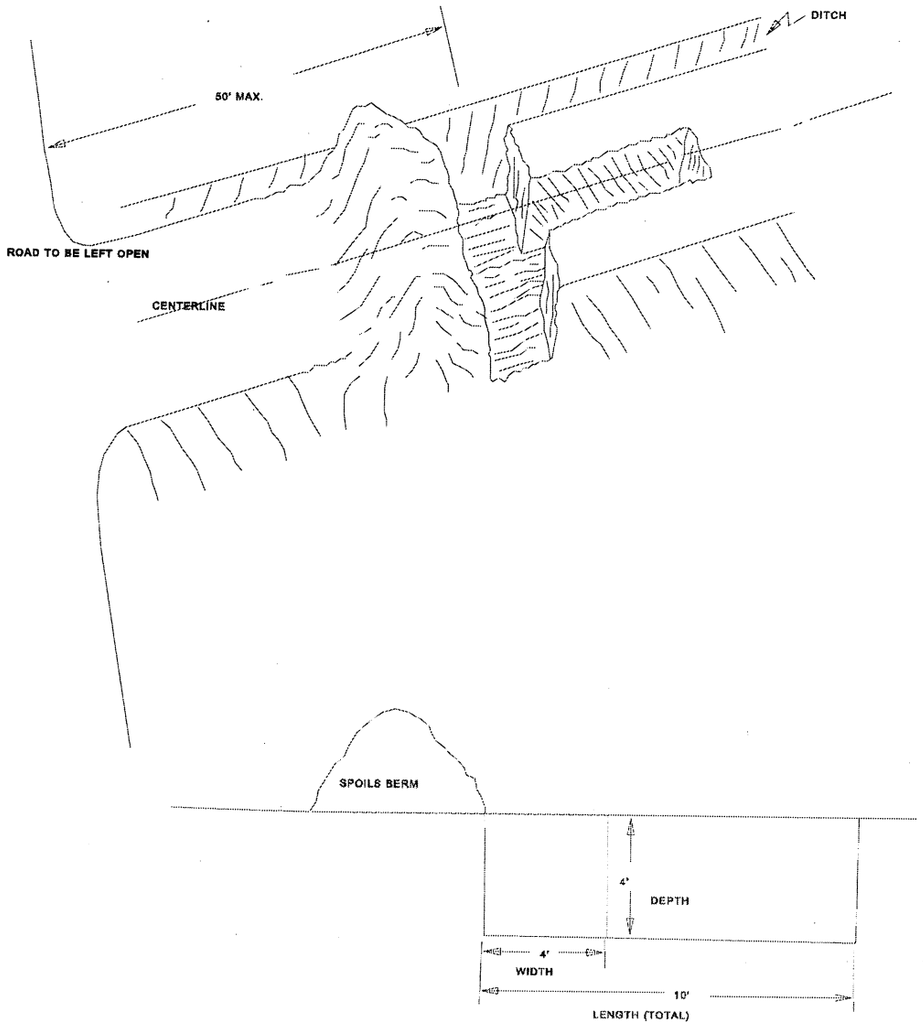


NON-DRIVABLE WATER BAR DETAIL





"T" TANK TRAP DETAIL



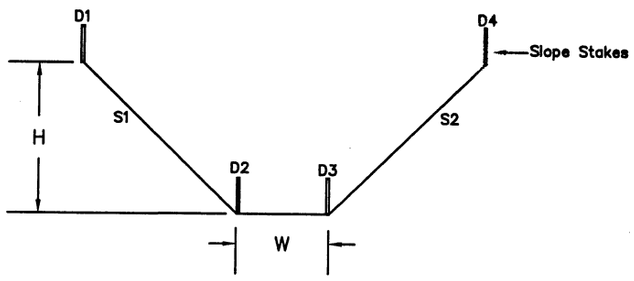
FILL REMOVAL SLOPE STAKE DETAIL

THE BOONDOCKS

N–1027

NOT TO SCALE

PROFILE VIEW – From Downstream



Station 20+00

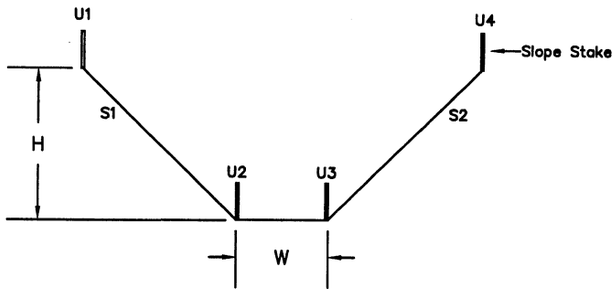
Restored Channel		RP Information: 20" Western hemlock				
H	10.5'		D1	D2	D3	4
w	8.0'	HD	18.31'	16.74'	23.82'	97'
S1	2:1	VD	6.13'	−4.29	−4.73'	55'
S2	2:1	Az.	148.0°	251.3°	253.1°	4°

Station 32+00

Restored Channel		RP Information: 36" Douglas–fir				
H	15.0'		D1	D2	D3	4
w	10.0'	HD	64.48'	94.89'	96.18'	83'
S1	2:1	VD	−8.75'	−23.89'	−25.21'	3.98'
S2	2:1	Az.	331.8	312.9°	312.3°	291.5°

NOTE: Magnetic declination is 0°

PROFILE VIEW – From Upstream



Station 20+00

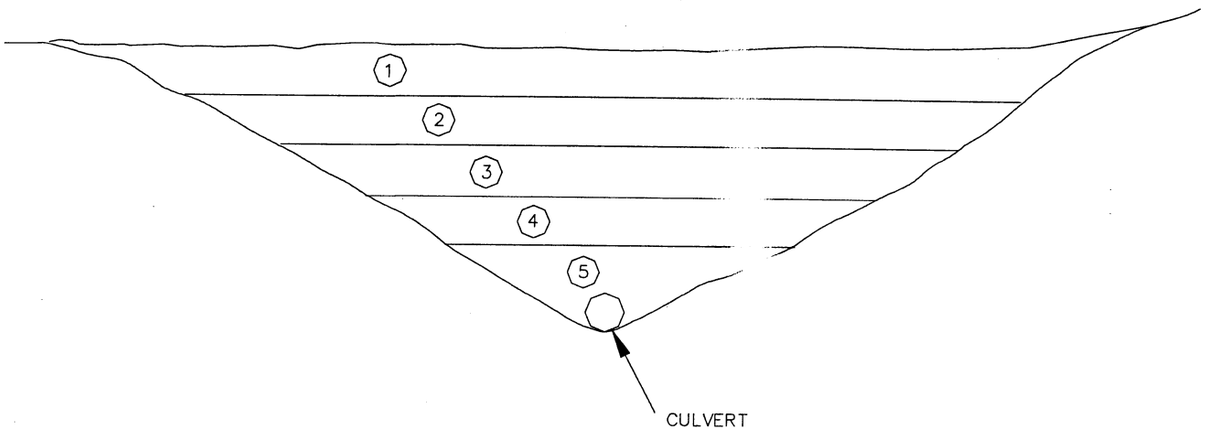
Restored Channel		RP Information: # 20" Western hemlock; *8" Cedar				
H	6.0'		#U1	*U2	*U3	#U4
w	8.0'	HD	57.51'	33.29'	29.46'	41.11'
S1	2:1	VD	7.64'	−8.14'	−8.62'	7.07'
S2	2:1	Az.	118.6°	280.7°	298.0°	159.2°

Station 32+00

Restored Channel		RP Information: 36" Douglas–fir				
H	10.0'		U1	U2	U3	U4
w	10.0'	HD	78.41'	33.76'	38.51'	26.98'
S1	2:1	VD	−6.16'	−9.74'	−12.40'	−5.69'
S2	2:1	Az.	280.0°	282.2°	296.0°	323.8°

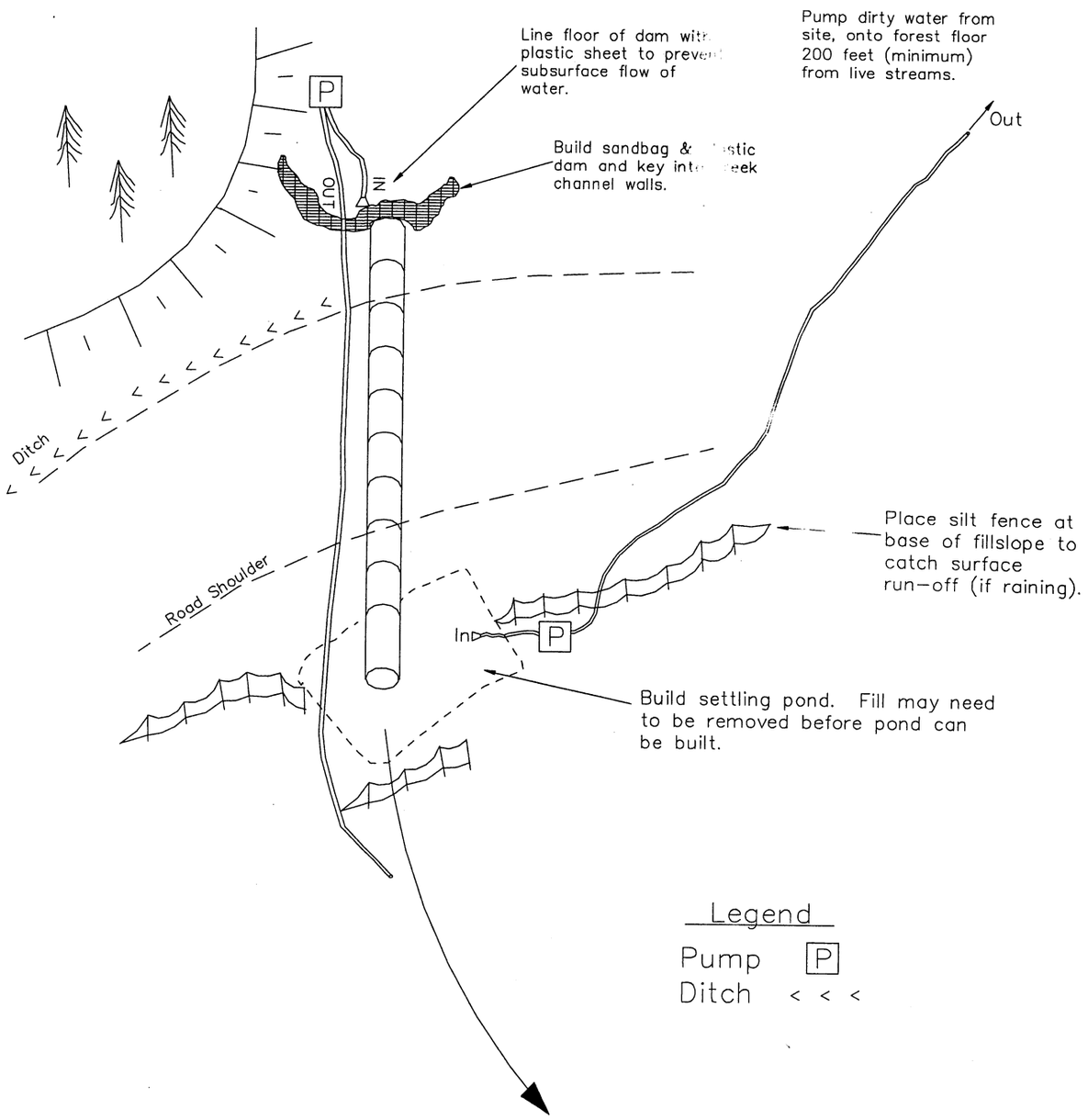
NOTE: Magnetic declination is 0°

FILL REMOVAL DETAIL



- Remove fill in layers not to exceed 3 feet.
- Channel slopes shall be according to Section 6 – DRAINAGE and the Live Stream Culvert Removal Procedure

SETTLING POND AND PUMP DETAIL



LIVE STREAM CULVERT REMOVAL PROCEDURE

Order of work is as follows, deviations shall be approved, in writing, by the Contract Administrator.

1) Purchaser shall notify the State of intent to start project, and a pre-work conference shall be held before move in of equipment. State will designate a representative that will remain on site at all times when work is being performed in creek channel.
2) Assemble the items on the "Materials List" onsite before proceeding.
3) Remove 95% of fill (see FILL REMOVAL DETAIL) and end haul or pushed to station 22+00 or 33+00 on the N-1027 road.
4) Set up pumps (3 required, with one as backup).
5) Dam up stream with sandbags and line floor of dam with plastic (to prevent sub-surface water flow), place clean rock on plastic to hold in place, and key leading edge of plastic into channel bottom - see SETTLING POND AND PUMP DETAIL. Build a settling pond at culvert outlet. Fill may need to be removed before the settling pond installation due to space limitations. Pump clean water at catch basin around work site and back into stream. Dirty water shall be pumped away from site and onto forest floor a minimum of 200 feet from live streams. Silt fence shall be erected at base of fill slope and bottom edge of fence shall be keyed into slope and held in place with rocks to prevent water from flowing under the silt fence.
6) Remove remainder of fill and culvert.
7) Backfill settling pond.
8) Cover exposed soils within 100 feet of all live streams with straw (minimum depth of 8 inches) and grass seed.

Materials List:

- 2 pumps, (one as a backup) The clean water pump (dam at culvert catch basin) shall have a minimum capacity of 600 gallons per minute. The dirty water pump (settling pond) and the backup pump shall each have a minimum capacity of 600 gpm. Culvert removal should not start during rain or threat of rain;
- 2,000 square feet plastic sheet;
- 300 feet of silt fence and stakes;
- 50 bales of straw.

DEPARTMENT OF NATURAL RESOURCES - PACIFIC CASCADE REGION

FORM 9-87(Rev. 12-02)

SUMMARY - Road Development Costs

DISTRICT: Lewis

SALE/PROJECT NAME: The Boondocks CONTRACT NUMBER: 30-076343

LEGAL DESCRIPTION: Section 8, Township 13 North, Range 05 West W.M.

ROAD NUMBER:	N-1000, N-1025, & N-1027	N-1027A, N-1028, N-1028 A	N-1027
ROAD STANDARD:	Secondary Mainline (12' R.S.)	Spur road (10' R.S.)	Abandonment
NUMBER OF STATIONS:	162.92	28.78	26.90
SIDESLOPE:	N/A	20%	35%
CLEARING AND GRUBBING:	$0	$2,041	$0
EXCAVATION AND FILL:	$532	$6,332	$3,426
ROCK TOTALS (Cu. Yds.):			
Ballast: 7593	$59,073	$10,630	$0
Riprap: 10	$55	$37	$0
CULVERTS AND FLUMES:	$1,527	$394	$0
STRUCTURES:	$0	$0	$0
GENERAL EXPENSES:	$5,507	$1,943	$411
MOBILIZATION:	$1,283	$1,283	$1,283
TOTAL COSTS:	$67,978	$22,660	$5,120
COST PER STATION:	$417	$787	$190

NOTE: This appraisal has no allowance for profit and risk.

TOTAL (All Roads) = $95,757

SALE VOLUME MBF = 3,500

TOTAL COST PER MBF = $27.36

Plans to be furnished by:

Plan only: STATE

Plan-profile:

Compiled by: M. Miskovic Date: 04/19/04

Checked by: _____ Date: _____

Region Engineer: _____ Date: _____

Div of Engr.: _____ Date: _____

REMARKS: _____

RoadCost

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: The Boondocks

CONTRACT NUMBER: 30-076343

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
N-1000, N-1025, & N-1027		*Reconstruction - No C & G required					162.92	$0

Clear and Grub TOTAL = $0

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
N-1000, N-1025, & N-1027	*Reconstruction - clean ditches only			$20		26.60	$532

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul				$0
Large Fills/ Cuts				$0

Excavation TOTAL = $532

III. BALLAST AND SURFACING :

Ballast source: N-1100 Quarry

8"+ source N-1100 Quarry

Description	cu.yds/sta x stations =	cubic yards
Ballast (2 1/2"-)		6,435
8" +		6

UNIT COSTS	Ballast	8" +
Drill & Shoot	$2.50	$2.50
Dig and load	$1.00	$1.00
Crushing	$3.25	$3.25
Purchase		
Haul *	$1.18	$1.18
Spread	$0.80	$0.80
Compact	$0.45	$0.45
Strip		
Reclamation		
TOTAL ($/cy)	$9.18	$9.18

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	5.0					
Ave. Speed =	25	Ballast (2 1/2"-)	6435	Cu. yds @	$9.18 /cu. yd =	$59,073
Delay (Hrs.)=	0.2	8" +	6	Cu. yds @	$9.18 /cu. yd =	$55
Cost / Hour =	$77.00					
CY / Load =	26					

Rock total = $59,128

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter	No/Length	Installed Cost/ft	Sub-total
	1	N/A	18	30	$11.80	$354
	1	N/A	18	40	$11.80	$472
	1	14	24	40	$16.70	$668
Bands & Gaskets	2	---	18	---	$9.90	$20
	1	---	24	---	$13.20	$13

Culvert total = $1,527

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total

Structure total = $0

Sub-TOTAL = $61,187

VI. GENERAL EXPENSES: Overhead & General Exp. Add 9% $5,507

VII. MOBILIZATION:

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	3	$300
Grader	400	1	$400
Compactor	400	1	$400
Excavator	450	1	$450
Dozer D8)	400	1	$400
Front end loader	400	1	$400
Rock crusher	$1,500	1	$1,500
Dozer (D5)	$240	0	$0

* Move in costs are averaged over all three sheets.

Total Mobilization = $3,850 Mobilization sub-total = $1,283

Road No. N-1000, N-1025, & N-1027

Standard: Secondary Mainline (12' R.S.)

Stations: 162.92

SHEET TOTAL = $67,978

By: M. Miskovic

Date: 04/19/04

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: The Boondocks

CONTRACT NUMBER: 30-076343

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
N-1027A, N-1028, N-1028 A	20%	35	1.00	2.77	$32	0.80	28.78	$2,041

Clear and Grub TOTAL = $2,041

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
N-1027A, N-1028, N-1028 A	20%	1.00	2.50	$88	1.00	28.78	$6,332

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul				$0
Large Fills/ Cuts				$0

Excavation TOTAL = $6,332

III. BALLAST AND SURFACING :

Ballast source: N-1100 Quarry

8" + N-1100 Quarry

Description	cu.yds/sta x stations =	cubic yards
Ballast (2 1/2"-)		1,158
8" +		4

UNIT COSTS	Ballast	8" +
Drill & Shoot	$2.50	$2.50
Dig and load	$1.00	$1.00
Crushing	$3.25	$3.25
Purchase		
Haul *	$1.18	$1.18
Spread	$0.80	$0.80
Compact	$0.45	$0.45
Strip		
Reclamation		
TOTAL ($/cy)	$9.18	$9.18

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	5.0					
Ave. Speed =	25.0	Ballast (2 1/2"-)	1158	Cu. yds @	$9.18 /cu. yd =	$10,630
Delay (Hrs.)=	0.2	8" +	4	Cu. yds @	$9.18 /cu. yd =	$37
Cost / Hour =	77.0	0	0	Cu. yds @	$0.00 /cu. yd =	$0
CY / Load =	26.0					

Rock total = $10,667

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
	4	N/A	18	30	$11.80	$354
Bands & Gaskets	4	---	18	---	$9.90	$40

Culvert total = $394

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0

Structure total = $0

Sub-TOTAL = $19,433

VI. GENERAL EXPENSES: Overhead & General Exp. Add 10% $1,943

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	$100	3	$300
Grader	$400	1	$400
Compactor	$400	1	$400
Excavator	$450	1	$450
Dozer D8)	$400	1	$400
Front end loader	$400	1	$400
Rock crusher	$1,500	1	$1,500
Dozer (D5)	$240	0	$0

Total Mobilization = $3,850 Mobilization sub-total = $1,283

Road No. N-1027A, N-1028, N-1028 A

Standard: Spur road (10' R.S.)

Stations: 28.78

SHEET TOTAL = $22,660

By: M. Miskovic

Date: 04/19/04

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: The Boondocks

CONTRACT NUMBER: 30-076343

I. CLEARING AND GRUBBING:

	Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
N-1027								26.90	$0

Clear and Grub TOTAL = $0

II. EXCAVATION:

	Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
N-1027		Waterbars, Ripping, fill-in ditches,			$75		26.90	$2,018

*End Haul, Over Haul, Large Fills/Cuts

		Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul					$0
Large Fills/ Cuts	Fill Removal (2)	250	1	$1,408	$1,408

Excavation TOTAL = $3,426

III. BALLAST AND SURFACING :

Ballast source: N-1100 Quarry

Surface source: N-1100 Quarry

UNIT COSTS	Ballast	Surfacing	Riprap
Drill & Shoot	$2.50	$2.50	$0.00
Dig and load	$1.00	$1.00	$0.00
Crushing	$3.25	$3.25	$0.00
Purchase	$0.00	$0.00	$0.00
Haul *	$1.18	$1.18	$0.00
Spread	$0.80	$0.80	$0.00
Compact	$0.45	$0.45	$0.00
Strip			
Reclamation			
TOTAL ($/cy)	$9.18	$9.18	$0.00

Description	cu.yds/sta x stations =	cubic yards
Ballast (4"-)		0
Surfacing (2 1/2"-)		0

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	2.0
Ave. Speed =	25
Delay (Hrs.)=	0.2
Cost / Hour =	$77.00
CY / Load =	20

Ballast (4"-) 0 Cu. yds @ $9.18 /cu. yd = $0

Surfacing (2 1/2 0 Cu. yds @ $9.18 /cu. yd = $0

Rock total = $0

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
						$0
Bands & Gaskets						$0

Culvert total = $0

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0

Structure total = $0

Sub-TOTAL = $3,426

VI. GENERAL EXPENSES: Overhead & General Exp. Add 12% $411

VII. MOBILIZATION:

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	3	$300
Grader	400	1	$400
Compactor	400	1	$400
Excavator	450	1	$450
Dozer D8)	400	1	$400
Front end loader	400	1	$400
Rock crusher	$1,500	1	$1,500
Dozer (D5)	$240	0	$0

* Move in costs are averaged over all three sheets.

Total Mobilization = $3,850 Mobilization sub-total = $1,283

Road No. N-1027A, N-1028, N-1028 A

Standard: Abandonment

Stations: 26.90

SHEET TOTAL = $5,120

By: M. Miskovic

Date: 04/19/04